



TO THE BAT-MOBILE!

ALISTAIR MACLENNAN ARGUES THAT LIDAR IS SET TO BECOME THE MOST PREVALENT GEO-BASED TECHNOLOGY IN THE WORLD – THANKS TO AUTONOMOUS DRIVING

"Daddy, how do bats see in the dark?" Anyone with a five year old child will be used to being asked questions just like that, usually every 10 minutes or so.

I should explain that this question arose as my daughter and I walked through our campsite in August this year and a cloud of bats swooped accurately around us.

So I explained that in 1939, Harvard students Donald Griffin and Robert Galambos successively taped up bats' eyes, ears and mouths and found that denying them use of either of the latter two made them fly into things. They had discovered that bats not only generate and hear noises that the human ear cannot but that they use this echolocation to avoid obstacles. That's how they 'see' in the dark.

She'd wandered off in the direction of the pinball machines.

If 'active' remote sensing holds no interest for a small child, it certainly has captured the attention of a host of rather grown-up industries. Whilst the medium is different, the principle of echolocation is at the heart of LiDAR (a mashup of the words 'light' and 'radar'). And LiDAR may yet prove to be the most prevalent geo-based technology in the world – if maps aren't classed as technological!

LiDAR devices use the same principles as our friends the bats but fire rapid pulses of light at a target instead of squeaks. Additionally, LiDAR sensors are able to create a three dimensional 'point-cloud' dataset. Since a single pulse can provide more than one reflection – or 'returns' in LiDAR-speak – information can be gathered, for example about the height of a tree, of the branches, and the elevation of the forest floor. The resulting 3D image provides a universally accessible route into otherwise complicated data.

It is this capability that has put LiDAR at the centre of what is being touted as the next great step forward for the human race: not taking any notice of where you are going, or as the industry is more commonly referred to, autonomous driving. Recently, Nokia announced that it had sold its mapping division, HERE, to a group of

German car manufacturers including Audi, BMW and Daimler (owners of Mercedes) for US\$3.1bn. Dieter Zetsche, chairman of the board of management of Daimler AG, said of the deal: "High-precision digital maps are a crucial component of the mobility of the future. With the joint acquisition of HERE, we want to secure the independence of this central service for all vehicle manufacturers, suppliers and customers in other industries."

In doing so, he revealed two important points. Firstly and unsurprisingly, 'high-precision' is everything when it comes to automatically controlling cars. Relying on GPS, with its resolution measured in metres, may find you facing oncoming traffic (ignoring the fact it will stop working all together in a tunnel) so you need incredibly accurate, pre-prepared images of the road network and a method of locating the car in that network. Google believes that LiDAR can fulfil both these key requirements and, judging by the price tag, so do HERE's purchasers.

The second is that the alliance of previously competitive companies that have bought HERE evidently view Google (and Apple, too, if the rumours are to be believed) as future competitors. Which is remarkable. The fact they feel they need to secure the 'independence of this central service' points to a future of car making that will bear no resemblance to today's market, one that could have completely new names as the main players.

When you visit your local dealer to buy your child's first autonomous car, will it be the styling, the power output or the number of coffee holders that decides which one you purchase? Of course not. The salesman's patter will concentrate on the safety provided by the accuracy of the technology that is controlling where they're going. It would appear that at least some of today's established car manufacturers have looked into the future and like our friend the bat, have concluded that they need to evolve a new way of navigating around it.

LIDAR MAY YET PROVE TO BE THE MOST PREVALENT GEO-BASED TECHNOLOGY IN THE WORLD

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